

ABSTRACT OF THE DISCLOSURE

This invention relates to an array, including a universal micro-array, for the analysis of nucleic acids, such as DNA. The devices and methods of the invention can be used for identifying gene expression patterns in any organism. More specifically, all possible oligonucleotides (n-mers) necessary for the identification of gene expression patterns are synthesized. According to the invention, n is large enough to give the specificity to uniquely identify the expression pattern of each gene in an organism of interest, and is small enough that the method and device can be easily and efficiently practiced and made. The invention provides a method of analyzing molecules, such as polynucleotides (*e.g.*, DNA), by measuring the signal of an optically-detectable (*e.g.*, fluorescent, ultraviolet, radioactive or color change) reporter associated with the molecules. In a polynucleotide analysis device according to the invention, levels of gene expression are correlated to a signal from an optically-detectable (*e.g.* fluorescent) reporter associated with a hybridized polynucleotide. The invention includes an algorithm and method to interpret data derived from a micro-array or other device, including techniques to decode or deconvolve potentially ambiguous signals into unambiguous or reliable gene expression data.